

²¹⁰PO DISTRIBUTION IN HYDROTHERMAL VENT ZONE AT GÜLBAHÇE, AEGEAN SEA

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The Gülbahçe Bay is a part of the Aegean Sea and has a very high seismic activity and many hydrothermal vent zones. Hydrothermal vent zones are known to have high sulphur and heavy metal concentrations. Due to their similar chemistry of polonium and sulphur, sulphur-rich zones are also enriched in ²¹⁰Po along with other natural radionuclides (Kadko et al, 1988). Since particulate fluxes are high at such zones, also ²¹⁰Pb flux is expected to be high.

In this study it is aimed to quantify the potential enhancement of naturally occurring ²¹⁰Po that may result from the high sulphur reducing and sulphur oxidizing regimes associated with hydrothermal vents. Sixteen sediment cores from Gülbahçe Bay were collected by Piri Reis Vessel Ship using gravity corer. They are sliced at 1 cm intervals and ²¹⁰Po determination were realized using alpha-spectrometer.

To obtain vertical distribution of unsupported ²¹⁰Po, ²¹⁰Pb (precursor of ²¹⁰Po) concentrations were determined from ²¹⁰Po activities after attaining the radioactive equilibrium between them. Po activities are measured through its 5.30 MeV alpha particle emission, using ²⁰⁹Po (0.1 Bq mL⁻¹) as the internal tracer. The vertical activity concentrations obtained from the cores analyzed so far varied between 98±5 - 29±3 and 100±5 - 27±2 Bq kg⁻¹ (results show top and bottom activities of a core and the other). The data presented here is preliminary results of our ongoing research.

The profile ²¹⁰Po distribution data in the cores from vent zone will be compared with the reference area to obtain pollution rate and also the relation between ²¹⁰Po activity and the seismic data in the study area.

Keywords: Hydrothermalism, radioactivity, ²¹⁰Po concentrations.